

XLI.

M E M O I R S

O F

L I T E R A T U R E.

MONDAY, December 18. 1710.

I.

A † CONTINUATION of the Extract of M. DE REAUMUR's Discourse, concerning the New Discovery of the Silk of Spiders, mention'd in the XXth Sheet of these Memoirs.

II. ALL sorts of Spiders do not afford a Silk, that can be worked; and those that afford it, spin it out only to make the Cods wherein their Eggs are enclosed. Wherefore I think it necessary to give a general Notion of the several Kinds of Spiders, to which all others may be reduced, and of the different manner how the Cods of those different Kinds are made; whereby one may know those that will afford Silk in this Kingdom. &c.

M de Reaumur went on and said, that M. Bon distinguishes Spiders into Two principal Kinds; viz. Long-legg'd and short-legg'd Spiders, and that the latter furnish the new Silk. He was very particular in describing all sorts of Spiders comprehended under those two principal Kinds, and gave an Account of those that will afford Silk, and of those that will afford none. He also shew'd how each sort of Spiders make their Cods, and said that the Silk of those Insects would be of more different Colours, than that of Silk-Worms, which is always yellow or white; whereas the Silk of the Cods of Spiders is not only Yellow and White, but also Gray, Blue, and of a fine brown Coffee-Colour. He added, that those Spiders, which afford a Silk of Coffee-Colour, are scarce, and that he never found any but in some Fields full of Brooms, where he also found some Cods, the Silk whereof was very fine and strong; and that those Cods were made in a different manner from all the other Cods of Spiders mention'd by him. &c.

In the next Place he said, that Spiders lay their Eggs, and make the Silk, wherein they are enclosed, in several Months of the Year; not only in August and September,

which is the only Time M. Bon allows for it, but also in May and the following Months; that Spiders spin out two sorts of Thread, one of which is design'd for their Webs, and the other, to enclose their Eggs; and that those Threads differ only by being more or less strong: Which he explain'd in the following manner.

I suppose 'tis well known that Spiders have several Nipples near their *Anus*, which are so many spinning Holes, in which that Liquor is moulded, which becomes Silk, when it comes out, and is grown dry. The Spiders in question, that is, those whose Silk is fit to be worked, have Six Nipples; four of which are very sensible, but the other two cannot be easily distinguish'd, without the help of a magnifying Glafs. Those Two small Nipples are each of them placed near the Basis of the Two large ones, which are nearest the *Anus*. Each of those sensible Nipples is made up of several other small Nipples, or insensible spinning Holes. Any one may easily be convinced of it, by squeezing the Belly of a Spider with two Fingers of the same Hand, to force the Liquor out of those Nipples, and putting another Finger upon one of them, and pressing it gently: many Threads will then come out, that are distinctly separated, and consequently must have pass'd thro' several Holes. Those Threads are too fine to be exactly told; but I may certainly affirm, that I have frequently been able to tell above Six or Seven. They will come out of the same Nipple in greater or lesser Numbers, according as the Nipple is more or less squeezed. And therefore one may easily apprehend how Spiders make their Threads bigger or lesser, whenever they please. For when they apply a greater Number of their Nipples against a Body, or when they do it with a greater Force, their Threads are made up of a greater Number of other Threads, and consequently, stronger and bigger.

There ought to be about Eighteen times more Threads that make up a Thread of a Cod, than there are in a Thread of a Cobweb, if the Quantity of Threads, that make up both, is proportion'd to their Strength. For having glued a weight of Two Grains to a Thread of a Cob-web, it generally kept it up without breaking, and generally broke when I put to it a Weight of Three Grains: Whereas a Thread of a Cod keeps up about Thirty six Grains; but it breaks, when loaded with a greater weight.

† See the foregoing Sheet.

But if the Threads of the Cods of Spiders are stronger than those of their Webs, they are weaker than those of the Cods of Silk-Worms, tho' in a lesser Proportion. The Strength of the Threads, which I winded out of the Cods of Silk-Worms, did generally keep up a Weight of Two Drams and a half. And therefore the Strength of a Thread of a Cod of Spiders is to that of a Thread of a Cod of Silk-Worms, as One to Five: And perhaps the old Silk is again preferable to the new one upon this very Account.

'Tis true, that each Thread of a Cod of a Spider is less big than a Silk-Thread, much in the same Proportion as it is less strong: But this will not wholly make up the Disadvantage. For the putting many Threads together is more difficult: Besides 'tis to be fear'd all the Threads will not draw alike, and consequently that their Collection will not have the Sum of the several Forces which each of 'em would have separately. That Multitude of Threads, necessary to make a Thread of the Silk of Spiders as big as a Thread of common Silk, is perhaps in some Measure the Reason why the Works made of that Silk have not so fine a Gloss as those that are made of common Silk. 'Tis certain their Lustre is not so fine, as an Eminent Academician observed, when the Mittens were brought to the Academy. The Gloss or Lustre of any Stuff seems to me to proceed only from its reflecting a greater Light than another Stuff of the same Colour. And therefore, the more small Vacuum's there are in a Silk-Thread than in another, the lesser will its Lustre be, because it will reflect a lesser Light. But 'tis plain there will be more such small Vacuum's in a Thread made up of many really distinct Threads, than in another, which having the same bigness, does not consist of different Threads: The several Parts of the viscous Liquor, of which it consists, being doubtless more contiguous, must needs touch one another in more places than several Threads really separated. And therefore supposing each Thread of the Silk of Spiders not to have naturally a better Gloss than a Thread of common Silk; 'tis plain that if Five of those Threads be put together, to make a Thread of the same bigness with that of common Silk; the compounded Thread, and the Work made of it, will not have so fine a Lustre as the Thread of common Silk, and the Work that will be made of it.

This would be true, supposing, as I have just now said, that a single Thread of a Spider has naturally as fine a Gloss as a single Silk-Thread: But that very Supposition is perhaps too favourable to the Silk of Spiders; for it may be observed, that the most crisped Thread has not so fine a Lustre as that which is less crisped. Hence it is that Wool, each Thread whereof is naturally more crisped than a Silk-Thread, has also a lesser Gloss. If therefore each Thread of the Silk of Spiders is naturally more crisped than a Thread of common Silk, it must have a lesser Lustre; which may easily be observed. It is no very difficult thing to find out the Reason why those Threads are more crisped than the others. The different manner of winding both is probably the Cause of it; for one may easily apprehend, that when Threads are winded in a loose way, the Spring of all the small Parts, of which they are made up, is entirely preserved; and therefore they exert all their Power to fold or frizzle them several different ways; whereas a close winding of Threads, like that of Silk-Worms, stops the Spring of those small Particles. The Spring it self wears out, or at least loses Part of its Strength in such a violent Situation. This will be the more readily granted, if it be consider'd that the first Threads of the Cods of Silk-Worms, which are loosely twisted about those Cods, are not so fine, and have not so great a Lustre, as those that form the Body of the Cod, and are closely winded.

A Thread of a Cob-web being, as I have said above, Eighteen times weaker than that of a Cod; this last Thread, which is five times smaller than a Thread of a Silk-Worm, should consist of Thirty six Threads at least. Perhaps this Reflexion may be of some use to raise our Imagination, when we endeavour to comprehend the prodigious Divisibility of Matter; for, how small must a Thread be, (tho' perceived by the Sight,) that does not exceed the hundred and eightieth Part of a Thread of single Silk; which Thread of single Silk is only the Two hundredth Part of a Silk-Thread to sow withal? For I have often divided those Silk-Threads into two hundred

Threads, or thereabouts: So that a Thread of Spiders Silk, as big as a Silk-Thread to sow withal, would really consist of about thirty six thousand Threads, and might be actually divided into a Thousand.

But to come to another main Point, which remains to be clear'd, let us see what Proportion there is between the Quantity of Silk, which each Spider yearly affords, and that of Silk-Worms. I have carefully weigh'd several Cods of Silk-Worms, and found that the biggest, that is, the yearly Work of one of those Worms, weigh'd Four Grains, and the smallest above Three: So that reckoning sixteen Ounces in a Pound, one must have at least 2304 Worms to get a Pound of Silk. Those, who wear Silk-Cloaths, do seldom think that many Thousands of Worms have been at work all their Lives to furnish the Matter they are made of.

I have as carefully weigh'd a great many Cods of Spiders, and always found that about Four of the biggest equalld the Weight of One Cod of Silk-Worms, and that each of 'em weigh'd about a Grain: So that one must have Four of the largest Spiders, to get as much Silk as a Worm can afford; supposing the same Waste in the Silk of those two Sorts of Insects. But the Cods of Spiders lose two Thirds of their Quantity; for out of Thirteen Ounces of foul Silk, M. Bon had only Four of neat Silk: That Diminution in the Cods of Spiders, proceeds from their being weigh'd with all the Eggs of small Spiders before they are hatch'd, and with a great deal of Nastiness mixed with the Silk. The Cods of Silk-Worms don't lose so much: The Abatement is so inconsiderable, that it may be made up, by supposing only an Abatement of two Thirds in the Silk of Spiders.

But we have just now seen, that the Weight of a Spider Cod, before it be made clean, is to the Weight of a Cod of a Silk-Worm, as 1 to 4; and therefore, when it is made clean, its Weight will be to the Weight of the latter, as 1 to 12. Thus it appears, that one must have 12 of the largest Spiders, to get as much Silk as a Silk-Worm can afford.

But every Silk-Worm makes a Cod, because the Males make theirs to take another Form; whereas Spiders make only their Cods to wrap up their Eggs, and therefore none but Female-Spiders make 'em. From whence it follows, that supposing as many Female-Spiders as Male ones, or thereabouts, (which is no unreasonable Supposition,) 24 of the largest Spiders will not afford more Silk than a Silk-Worm.

One must therefore have about 55:96 of the largest Spiders to get a Pound of Silk; and they must be bred by themselves for several Months. Whereby it appears, that this Silk would occasion such Expences as would not answer its Value, since it would be 24 times as dear as that of Silk-Worms; even supposing there was no Necessity of lodging each Spider by it self; and that each of 'em would take up no more room than a Silk-Worm: which cannot be supposed; for every Spider must have Room enough to make its Web. But if I was to make an exact Computation of the Charges requisite to feed them by themselves, and to give each of 'em a convenient Lodging, it would plainly appear that the Silk of Spiders would be incomparably dearer than that of Silk-Worms.

I would not have any body to think, that what I have said concerns only Spiders of an ordinary Size; for if any one was desirous to know what Quantity of Silk might be had from the large ones, that are commonly to be found in the Gardens of this Country, it would appear that 12 would not afford more Silk than one of the Cods of those I have mention'd; and that 288 would only furnish as much Silk as one single Cod of a Silk-Worm; and consequently, that 663552 Spiders could hardly make a Pound of Silk.

The Publick will doubtless be concern'd for the little Success that can be expected from such an ingenious Discovery; but perhaps there are still some Hopes. There may be larger Spiders than those that are commonly to be seen in this Country. It appears from the Relations of all Travellers, that those of America are of a much larger Size than ours, and consequently more likely to afford a greater Quantity of Silk. Our Silk-Worms, tho' originally come from remote Countries, are so prodigiously increased in Europe, that we may reasonably hope

the Spiders of America might live in this Kingdom. However, we must make Experiments: 'Tis the only way of finding out curious and useful Things. I shall not be wanting in any thing that may concern the present Enquiry; and if any useful Discovery be made hereafter, M. Bon will have the first Glory of it.

II.

S U I T E du Supplement à l'Histoire de l'Origine & du Progrès des revenus Ecclésiastiques.

That is, A † Continuation of the *Supplement to the History of the Origin and Progress of Ecclesiastical Revenues*.

M. SIMON reckons the frequent Use of Indulgences among those Things, that brought a good Income into the Churches and Monasteries. The Popes granted them too easily, especially in the latter Ages; and our Author observes they were carried to such an Excess, that when Luther attack'd them, most Scholastick Divines found it a very difficult thing to answer his Objections. Indulgences, in their first Origin, were only a Relaxation of the Penances imposed upon Sinners. Each Sin was punish'd with a certain Punishment: The Bishops and Priests were obliged to follow the Canons made for that purpose, as it appears from the Penitential Books that are still extant. But because it was sometimes necessary to abate something of that Ancient Severity, the Relaxation, or Mitigation of Canonical Penances, was call'd an *Indulgence*. Such is the Origin of Indulgences: The Profit arising from them, moved the Clergy to carry them much farther than what they were at first. The Ghostly Fathers, out of Regard for their Penitents, thought fit to depart from the Ancient Severity, especially in the XIIth Century. The Penitents were allowed to buy off the Penances, laid upon them by the Canons of the Church. The Money arising from it, was generally design'd for the Maintenance of the Poor: Which brought a great deal of Wealth to the Clergy, because Kings and Princes proved very liberal to them, in Hopes of Redeeming their Sins; considering that what they bestowed upon them, was design'd for the Relief of poor People. The Clergy began also in those Times to enjoin long Prayers for a Penance; for instance, to recite the *Psalms*, &c. Besides, the Penitents were order'd to have Masses said for them, and to discipline themselves: But the most general Penance was, to give Money, whereby every body was dispensed from undergoing the Punishments establish'd by the Canons. Nay, they rated every Penitent in proportion to His Sins; which gave 'em a fair Opportunity of increasing the Number of Years appointed for Penances, that more or less Money might be paid according to the Number of Years.

Many Bishops improved that admirable Invention of buying off one's Sins, which was so profitable. Maurice Bishop of Paris, who govern'd that Church for the space of 32 or 33 Years, towards the latter end of the XIIth Century, distinguish'd himself by his Industry in that respect. He built the Cathedral Church of Paris, and besides founded and endowed Four Abbeys. That vast and noble Fabrick, and the Four Abbeys, were not raised up at his own Charges; for he was a Man of mean Extraction, and very poor. How came he then to perform such a great Enterprize? He undertook to dispense those, who should bring in Money for that purpose, from doing Penance for their Sins. It was by such a Spiritual Industry that the Bishop, notwithstanding his Poverty, was enabled to spend more Money than the Royal Treas-

sure would have afforded. *Hac te spirituali industria tantam auri argenteique sumam collegit, us komo pauperissimus omnibusque bonis nudatus in sumptibus ferendis perfecerit, quibus Regiae dicite non sufficerent.* Several Bishops, perceiving the great Success of that Admirable Invention, imitated their Brother Maurice.

After these Observations, M. Simon shews that the Popes have no Power to raise any Money in France, upon any pretence whatsoever, even for Pious Works, without the King's Consent. He adds, that notwithstanding the wise Precautions that have been used to hinder Foreigners from making any Gatherings in that Kingdom; there are still some Ramblers, who in the Name of our Lady of Montserrat, and under some other Pretences of Devotion, get Money from the Country-People, whose Names they write down, upon Promise that they shall have a Share in the Prayers that are said at Montserrat. Our Author gives us some Instances of the Tricks and Impostures of those begging Ramblers, who formerly preach'd up Indulgences. They became so intolerable, that the Council of Vienne, under Pope Clement V. found it necessary to make a Decree against them.

The Mendicant Friars were also formerly accused of getting a great deal of Money by Confessions and Burials. Richard, Archbishop of Armagh, blames them for it in his Book, entitl'd, *Defensorium Curatorum contra eos qui privilegiatis se dicunt*. Ever since those Monks, says he, have obtain'd a Privilege to hear Confessions, they have built very fine Monasteries and stately Palaces. Whereupon M. Simon observes that the Mendicant Friars were at first very much esteem'd and admired by the People, who proved very Liberal to them. But he adds, that they have lost their great Reputation long ago. The Jesuits, who came in since, and who live a more Regular and Exemplary Life, have got the best Trade. They had also very powerful Enemies, from the very beginning of their Society, who accused them of making Religion subservient to their Interests, of insinuating themselves into the Minds of great Men, and of attending or rather besetting them upon their Death-bed, to have a share in their Estates.

M. Simon observes, that 'tis a dangerous thing to establish too many regular or secular Communities, because when they are establish'd, they want to be maintain'd, and in order to it, they use all possible means to enrich themselves. " Many devout Women, who fancy that God speaks to them thro' the Mouth of their Ghostly Fathers, don't scruple to deprive their Heirs of their Succession, tho' they have not wherewithal to live, and to bestow their Estates upon rich Communities. All possible Care should be taken to prevent the Multiplication of those Communities, especially in little Towns, whose Inhabitants not having so much Experience as those of great Cities, are more inclined to leave whatever they have to those Societies.

Our Author very much commends those Judges, who use their utmost Endeavours to prevent the making of any Will in Favour of a Religious or Secular Community. He mentions an Arrest of the Parliament at Paris in the Year 1619. whereby that Part of the last Will of the Bishop of Beauvais, which concern'd the Fathers of the Ora**ratory**, was declared null and void. The Parliament of Aix made also a Decree against the same Fathers of the Ora**ratory** in 1675. and annull'd the last Will of a private Man in their Favour.

I shall conclude this Extract with another Observation of M. Simon. " We know by Experience, says he, that those new Congregations of black Monks, that is, of Benedictins, which have been establish'd under pretence of a greater Good, have not had the desired effect. Perhaps it were better for the good of the Church and State to suppress them, and to reduce the Monks to the same Condition they were in at the time of their Institution.

It appears from this *Supplement to the History of the Origin and Growth of Ecclesiastical Revenues*, that the Clergy of the Church of Rome have been very Industrious in finding out Ways and Means to enrich themselves. If the Protestants publish hereafter a new *Catalogus Testium veritatis*, or a new Edition of the old one, enlarged, M. Simon will doubtless be placed in it with great Distinction.

† An Account of the first Part of this Supplement may be seen in the XXXVIIth Sheet of these Memoirs.

† Morinus de sacra Pœnit. l. 10. c. 20.

PARIS.

Father Calmet, a Benedictin Monk of the Congregation of St. Vanne and St. Hydulphus, who designs to write a Literal Commentary in French upon the whole Bible, has already publish'd Three Volumes of that Work, in 40. The Third, which contains his Commentary upon the Numbers and Deuteronomy, came out last Year. That Commentator has been attack'd by M. Fourmont. This Author, who is a young Man, and a great Admirer of the Rabbins, having publish'd Two Letters against the Commentary of Father Calmet upon Genesis; [See pag. 32. and 104. of these Memoirs] Father Calmet has newly put out an Answer, consisting of Four Letters.

Lettres de l'Auteur du Commentaire littéral sur la Genèse, pour servir de Réponse à la Critique de M. Fourmont contre cet Ouvrage. Paris, 1710. in 120. pagg. 160.

M. Fourmont blames Father Calmet, for not proving that Moses is the Author of the Pentateuch. Father Calmet answers, that this is a groundless Objection; since he never design'd to alledge any other Proof, but the constant and universal Tradition, which ascribes to Moses the Five Books that go by his Name. Such a Tradition appears to him a sufficient Reason to remove all manner of Doubts upon this Head. The Authority of some few Writers, who have asserted a contrary Opinion, out of Singularity, can be of no great Weight. "If, says he, the Testimony of a single Man was sufficient to question the Truth of a Book, or to make one doubt of the Author; what would become of us? Have we not seen a Learned Man call into Question the greatest part of the Writings ascribed to the Ancients? Have the true and ancient Writers, whose Names they bear, lost their Possession upon that Account? Has the Publick submitted to that Judgment? Those, who had some particular Reason to assert that Doubt, and the Author himself, did not publickly disown it, by reason of the dangerous Consequences that might arise from it". The Author infers from this Instance, that some few Criticks, who have raised Doubts against Moses, cannot invalidate a Possession that is generally acknowledged.

Father Calmet affirms, that there are some Passages in the Pentateuch, which Moses could not write; but, says he, it does not follow from thence, as M. Fourmont pretends, that Moses is not the Author of the Pentateuch. "If some Glosses and Alterations made by chance, or designedly, in the Text of a Book, are sufficient to assert that a Book was not written by the Author whose Name it bears, tho' no Objection can be raised against the remaining Part of the Work; will any Book be free from Censure? At this rate, St. Matthew, St. Mark, and St. Luke, did not write the Gospels ascribed to those Evangelists, because some small Additions have been observed in them. According to that rule, the Canons of the Councils, and the Works of the Fathers, that are most unquestionable, can be no longer attributed to the Authors, whose Names they bear, because there are none free from small Faults."

M. Fourmont takes it ill, that Father Calmet should not express a due Esteem for the Rabbins. Father Calmet maintains still that most Jewish Writers want Judgment, and are full of absurd and extravagant Notions. He does not pretend that all the Writings of the Rabbins are to be despised; what he says concerns only the greatest Number. He gives some Instances of their odd way of explaining the Scripture. "Their God roars, is angry, weeps, and sheds upon the Ocean Two Tears, the Fall whereof reaches from one end of the World to the other: They mean the Thunder. His Word occasion'd the miscarriage of all the Women in their City, and struck out all the Teeth, even

"the Grinders of the Romans. The Emperor being thrown down from his Throne had recourse to Rabbi Joshua, and persuaded him to beseech his God to go home. The same Rabbins say, that God having one day a Dispute with an Angel about the Leprosy, the Rabbin Son of Nachman was made their Arbitrator: There was a Necessity to send him into Heaven; but it was no easy thing to make him die, for he was continually reading the Holy Scripture, and no Man can die whilst he reads it. The Angel of Death not being able to come near him, God rais'd a Storm, which shook the neighbouring Reeds: The Rabbin being frighted left off Reading immediately; whereupon the Angel took hold of him, and carried him into Heaven.

Here follow some other Instances out of the Talmud. "On the first Hour of Adam's Creation, God gathered the Dust of which he was to be made. On the second Hour, Adam stood upon his Feet. On the Fourth, he call'd every Animal by its Name. On the Seventh, he was married to Eve: God was pleased to be the Par-nymph of that Marriage. He made with his own Hands the Canopy under which Eve received the Nuptial Benediction, and brought down from Heaven the Angels to make a Consort of Musick. He himself dres'd the Bride and curl'd her Hair; and that sort of Curl has been transmitt'd to the Jewish Women from one Generation to another. . . . Adam was not a Man of an ordinary Size. The tallest Giants were but Pigmies, if compared with him; his Head reach'd to Heaven. The Angels, being amazed at it, fell a murmuring, and made their most humble Remonstrances. God consider'd the thing, and being sensible of the Fault he had committed, reduced Adam to the height of a Thousand Cubits. Og King of Bashan is recorded in Scripture as a Famous Giant. The Jews will have it that he was one of those who lived before the Deluge. They tell us, that he could lift up a Mountain as easily as another Man can lift up a Stone of an indifferent size. When Moses advanced to make War with him, Og took a huge Mountain, and put it upon his Head, to crush in Pieces the whole Host of the Israelites: But God permitted the Ants to make a Hole thro' the Mountain; and it fell upon his Shoulders like a Collar: At the very same time, his Teeth grew so prodigiously that they got into the Mountain. Thus, being no longer able to throw it down, he was kill'd by the Enemies.

The Author quotes many Writers, who despise the Explications of the Rabbins; and then answers what M. Fourmont says in their Vindication.

M. Bion has publish'd a new Edition very much enlarged, of his Treatise concerning the use of Celestial and Terrestrial Globes, and Spheres, &c.

L'Usage des Globes Célestes & Terrestres, & des Sphères, suivant les différents Systèmes du Monde. Par le Sieur Bion, Ingénieur pour les instruments de Mathématique. Paris, 1710. in 8vo. pagg. 372.

This Work consists of Three Parts. The first is a Treatise of Cosmography, wherein the Author explains the Systems of the World, the Circles of the Sphere, the Motion of the Stars, &c. The second Part is a Treatise of Geography. M. Bion applies the Sphere to that Science: He describes the Earth and the Sea, and then gives an Historical Account of the four great Parts of the World, and of the different States contain'd in them. In the third Part, he gives a Method of making Globes and Geographical Maps. He shews the different Uses of the Globes and Sphere; and particularly endeavours to explain the three Uses of the Sphere of Copernic, which concern the three Motions ascribed to the Earth by that Astronomer. This Work is adorn'd with 42 Copper-Cuts.